render it patent. Some of the bad results seen in many of the other clinics may be attributed to operators who attempt to do the standard type of mastoidectomy in these critically ill patients.

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Diphtheria

Synthetic Diphtheria Antitoxin.—Under the stimulus of the newer concepts of immunology [1] several recent attempts have been made to prepare artificial specific antitoxins. A very suggestive result has recently been reported by Sdrawosmisslow and Kostromin of the Bacteriological Institute, Perm, Russia.[2] These workers incubated diphtheria toxin with a large excess of trypsin, and obtained a nontoxic toxin "trypsinate" which, in their hands, was apparently identical with true diphtheria antitoxin.

Although Kimmelstiel of the Hygienic Institute, Breslau, Germany [3] has recently questioned this conclusion, offering an alternate explanation of their observed antitoxic effects, she does not question their claim that their "trypsinate" has distinct antitoxic properties.

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REFERENCES

1. The Newer Knowledge of Bacteriology and Immunology, University of Chicago Press, Chap. 81, p. 1078.

2. Ztschr. f. Immunitätsforch u. exper. Therap., Vol. liv, p. 1, 1927-28.

3. Ibid., Vol. lxii, p. 245, 1929.

Medicine

PART II*

The Present Status of Liver Function Tests. It is a very different story with the excretion tests of liver function. Here we have at our command at least three reasonably simple tests of which we can expect definite information in regard to suspected liver injury in individual cases. In the first place, there is the quantitative estimation of serum bilirubin by means of Bernheim's icterus index,[1] or the more complicated quantitative van den Bergh. Then we have the quantitative urine urobilogen test, the simplest of the three, if the Wallace-Diamond technique be used.[2] Finally, one can use one of the dye excretion tests of which the Rose-Bengal [3] test is preferable to others. Below is given a brief discussion on what tests to select and what to expect of them in the more common liver conditions.

1. In *catarrhal jaundice* the icterus index and the dye excretion tests are practically parallel in their reports on the degree of liver injury and the same is true of the urine urobilinogen except that at the height of the disease there is almost no urobilogen found probably due to almost complete obstruction of the bile passages. Since these liver function tests have taught us that in catarrhal jaundice the amount of liver damage is parallel to the depth of jaundice, there is for all practical purposes no necessity of doing them in ordinary cases of this disease.

2. In *obstructive jaundice* of any type the depth of color is a satisfactory measure of the amount of liver damage just as in catarrhal jaundice. In addition, here it is often valuable to know, from the standpoint of diagnosis and prognosis, the exact degree of jaundice and especially its trend to increase or decrease. In this respect the icterus index is much more accurate than the eye. In complete biliary obstruction urobilogen disappears from the urine altogether.

3. In *arsenical jaundice* all three tests are positive and about equally reliable. No arsenicals should be given till the return of function to normal, as shown by one or more of these tests.

4. *Carcinoma of the liver* and bile ducts with obstruction belongs in the class of obstructive jaundice. In carcinoma of the liver without obstruction, dye excretion seems to be impaired most often (in about 70 per cent of cases in one series), an increased icterus index is a close second (in about 60 per cent) and increase in urobilogen comes third with positive results in only 40 per cent of cases. The explanation for such poor results is that carcinoma involves the liver only in spots, leaving much healthy liver tisssue for compensation of function. From this it can be said that in suspected cases of carcinoma of the liver only positive results are of value.

5. *Cirrhosis of the liver,* whether of the portal or biliary type, always shows a reduction of dye excretion, the extent of which is a reliable guide to the degree of liver damage. This fact is of special importance since the icterus index only shows the presence or absence of latent jaundice in portal cirrhosis and the degree of jaundice in biliary cirrhosis, while the increase in urobilogen is by no means a constant factor in cirrhosis as well as in other chronic liver conditions. The dye test is of special value in differential diagnosis of portal cirrhosis in the presence of ascites because dye excretion is normal in cardiac failure, tuberculous peritonitis, and carcinomatosis of the peritoneum. On the other hand, urobilogen is often increased in chronic passive congestion of the viscera.

6. In *severe infections of the liver* both the dye retention and increase in urine urobilogen are marked and express the degree of liver involvement, while the increase in the icterus index may be slight.

7. Finally, in *diseases of the hematopoietic system* like hemolytic jaundice, pernicious anemia, polycythemia, leukemia, and Gaucher's disease, dye elimination is normal. In Banti's disease dye retention indicates the presence of cirrhosis of the liver. The icterus index in these conditions serves merely as an index of hemolysis and urine

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